

	A	B	C	D	E	F	G	H	I	J
1	Fish whole-body tissue residue TRV studies									
2										
3										
4	Chemical form	Receptor	Lifestage	Endpoint	Endpoint Detail	NOAEL (pg/g ww)	LOAEL	ACR (8.3) applied?	Final Whole Body Conc. (pg/g ww)	Final Species LOAEL (pg/g ww)
5	2,3,7,8-TCDD	carp	1 yr old	mortality	reduced survival (37% reduction in survival)		2,200	no	2,200	2,200
6	2,3,7,8-TCDD	coho salmon	juvenile	growth, survival	growth, survival	125	2,170	no	2,170	2,170
7	2,3,7,8-TCDD	fathead minnow	juvenile	survival	survival		69,000	yes	8,313	8,313
8	2,3,7,8-TCDD	Gobiocypris rarus	young	reproduction	female to male ratio		100	no	100	100
9	2,3,7,8-TCDD	Japanese medaka	larvae (one month old)	growth	reduced growth		1,110	no	1,110	1,110
10	2,3,7,8-TCDD	lake whitefish	juvenile	growth	growth	46	85	no	85	85
11	2,3,7,8-TCDD	medaka	juvenile	growth	growth		2,410	no	2,410	2,410
12	2,3,7,8-TCDD	Rainbow trout	juvenile	growth	body weight	72	150	no	150	487
13	2,3,7,8-TCDD	Rainbow trout	10-15 cm	growth	body weight		780	no	780	
14	2,3,7,8-TCDD	Rainbow trout	fry	growth	growth		990	no	990	
15	2,3,7,8-TCDD	Rainbow trout	fry	survival	survival		980	no	980	
16	2,3,7,8-TCDD	zebrafish	adult	reproduction	offspring survival		9,000	no	9,000	9,000
17	2,3,7,8-TCDD	brook trout	adult	growth, survival, reproduction	survival, growth, gonadal development, egg production	1,486		no		
18	2,3,7,8-TCDD	medaka	swim up	survival and abnormalities	EC50		1,334			
19	2,3,7,8-TCDD	rainbow trout	juvenile	growth, survival	reduced survival and growth	0.33	1.6			
20	2,3,7,8-TCDD	rainbow trout	swim up	survival and abnormalities	EC50		112			
21	2,3,7,8-TCDD	Rainbow trout	young	growth, survival	body weight	1,570	1,380,000	no	1,380,000	
22	2,3,7,8-TCDD	rainbow trout	adult	survival	reduced survival		12			

	K	L	M	N	O	P
1						
2						
3						
4	Reference	Exposure Route	Exposure Duration	General Notes	Acceptable for TRV derivation?	Reason not acceptable for TRV derivation
5	Cook et al. 1991 (draft unpublished version)	water	71 days	Filtered Lake Superior water was used in exposure tanks. There were controls but data were not presented. TCCD tissue concentrations were close to zero at beginning of experiment (estimated from graph); indicating controls were this low also.	Yes	
6	Miller et al. 1979	water	96 hr	body burdens measured after 114 days in clean water following exposure	Yes	
7	Adams et al. 1986	water	28 day	no statistics; 100% mortality; LOAEL is average concentration in dead fish	Yes	
8	Wu et al. 2001	water	120 days	Fertilized eggs exposed for 120 days. Tissue concentration approximate because it was derived from graph for 10 pg/L group (Figure 6). No statistics compared to the control. Sex ratio was dose-responsive for all 4 dosed groups.	Yes	
9	Kim and Cooper 1998	water	larvae exposed for 96 hrs; effect measured 4 weeks later	Other effects were jaw deformation, multifocal hemorrhages in the head, fin erosion	Yes	
10	Fisk et al. 1997	food	30 days	exposed for 30 days and effect measured for 180 days post-exposure; reported body burdens are whole body minus liver. A citation in the paper (Kleeman et al. 1986) indicates that the liver accounts for 2% of the body burden.	Yes	
11	Schmieder et al. 1995	water	12 days	no statistics; growth increased 74% vs. 94% in control	Yes	
12	Fisk et al. 1997	food	30 days	exposed for 30 days and effect measured for 180 days post-exposure; reported body burdens are whole body minus liver. A citation in the paper (Kleeman et al. 1986) indicates that the liver accounts for 2% of the body burden.	Yes	
13	Branson et al. 1985	water	2 and 6 hr	no statistics; LOAEL presented is based on tissue residues measured 28d after end of exposure, LOAEL is misleading; higher LOAEL should be used (max WB for dose, WB at end of exp, etc); tissue burdens assoc with same dose but measured earlier in exp were higher	Yes	
14	Mehrle et al. 1988	water	~28 days	LOAEL is based on tissue residue measured at the end of the exposure period	Yes	
15	Mehrle et al. 1988	water	~28 days	LOAEL is based on tissue residue measured at the end of the exposure period - growth reported in same study.	Yes	
16	Heiden et al. 2005	food	20 days	No statistics presented, but 10% of females from the 40 ppb treatment group showed gross morphologic signs of ovarian necrosis and there was an 11% decrease in percentage of offspring that survived 24 hours post fertilization. Tissue concentrations measured separately for ovary, brain, digestive tract, and carcass. Whole body concentrations calculated from Figure 1 and Table 1, so concentrations are approximate. EPA database selected 3,000 pg/g as LOAEL based on ovarian necrosis.	Yes	
17	Tietge et al. 1998	food	182 days	NOAEL is initial concentration in female fish exposed to 1,200 pg TCDD/g-food	No	NOAEL only
18	Weston Solutions 2004	embryo injection		LOAEL is an EC50 concentration based on an egg injection study; the concentration is a whole body concentration converted from 2667 ng/kg ww in eggs to 1334 ng/kg using a conversion factor of 0.5 presented in Weston Solutions 2004.	No	eggs injected with chemical; LOAEL is a whole body concentration converted from an egg concentration
19	van der Weiden et al 1990	IP injection	12 weeks	Estimated dose based on heaviest fish weight. Focus of study on more sensitive endpoints (EROD, histology), estimated dose based on heaviest fish weight to get most conservative estimate; based on injection of 2,3,7,8-TCDD dissolved in peanut oil	No	injection study; focus was on more sensitive endpoints
20	Weston Solutions 2004	embryo injection		LOAEL is an EC50 concentration based on an egg injection study; the concentration is a whole body concentration converted from 223 ng/kg ww in eggs to 112 ng/kg using a conversion factor of 0.5 presented in Weston Solutions 2004.	No	eggs injected with chemical; LOAEL is a whole body concentration converted from an egg concentration
21	Hawkes and Norris 1977	food	105 days		No	residue represents a single fish held frozen for several months after the experiment was terminated; the single control fish also analyzed was contaminated with 475 pg/g TCDD.
22	Giesy et al. 2002	food	~300 days	LOAEL of 0.44 pg/g ww in fillet tissue measured at day 200 converted to concentration at approximately day 300 when mortality was observed based on recommendation from the author (Giesy 2006- pers comm with Windward) using a fillet-to-whole body conversion factor of 28	No	converted from fillet concentration using fillet-to-whole body conversion factor of 28

	A	B	C	D
1	Created By Version	5.7.1		
2	Required Version	5.0.0		
3	Recommended Version	5.0.0		
4	Modified By Version	5.7.1		
5				
6				
7				
8				
9	Count	1		
10	GUID	Name	Range	CRC
11	FIT_EFE17_9BDB3	Dataset 1	2,410	0

	E
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	Options
11	F100-1E+300 1E+300 103 00 121BetaGeneralBetaSubjBinomialExponExtValueGammaGeometrIntUniformInvGaussLogisticLogLogisticLognormNegBinNormalParetoPearson5Pearson6PoissonTriangUniformWeibull01- 11 0 1000

	F
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	Comp. Graph Serialization GF1_rK0qDwEACACRAQwjACYANwBqAHMAdACAAIwAbwEpAIsBLQD//wAAAAABAQEAAQQAAAAAAAAAAEcRmI0IENbxBhcmzb24gZm9yIeRhGfzZXQgMQRUmlza0V4cG9uKDMyOTUuNykBAQUAAQABAwEBAP8BAQEBAQABQEAAgABAQEBAQABAQEAAgAKqwABuQAAxwAA3AAA8QAABgEAGwEAMAEARQEAWgEADAIFSW5wdXQACUBAgAMAAVFehBvbgABLwECABMADFVudXNIZCBDdXJ2ZQACTwECABMADFVudXNIZCBDdXJ2ZQADJAECABMADFVudXNIZCBDdXJ2ZQAETAECAFBMADFVudXNIZCBDdXJ2ZQAFQECABMADFVudXNIZCBDdXJ2ZQAGTgECABMADFVudXNIZCBDdXJ2ZQAHlwECABMADFVudXNIZCBDdXJ2ZQAIKQECABMADFVudXNIZCBDdXJ2ZQAJYAECAhBgQEBAQIBmpmZmZmZqT8AAGZmZmZmZu4/AAFAAEBAQa=
11	

	G
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	PP Graph Serialization GF1_jYW3AgEACAB5AQwjAAAAMAB6AlMAhACdALcAAAAAAAAAAJgD//wABAFFFFFFASlQcm9jYWJpbGl0eS1Qcm9iYWJpbGl0eSBQbG90IG9mIERhdGFzZXQgMQEbUmlza1dlaWJ1bGwoMC43NDExMCwyNjE2LjUpAQEFAAEAQMAAQD/AQEBAQENSW5wdXQgcC1WYWyx1ZQEBAAQACAAEBQEBDkZpdHRIZCBwLVZhbHVAQEBAAlACdMAB+EAB/QABwcBBx0BBy0BB0ABB1MBB2YBBw4AB1dlaWJ1bGwAAC8BEwAMVW51c2VkiEN1cnZIAFPARMADFVuudXNlZCBDdXJ2ZQAcjAETAAxVbnVzZWQgQ3VydmlUA0wBEwAMVW51c2VkiEN1cnZIAQ5ARMADFVuudXNlZCBDdXJ2ZQAFtgETAAxVbnVzZWQgQ3VydmlUAbiMBEwAMVW51c2VkiEN1cnZIAAcpARMADFVuudXNlZCBDdXJ2ZQAIyAE=
11	

	H
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	QQ Graph Serialization GF1_jYW3AgEACAB1AQwjAAAAMAB0AH0AfgyCALMAAAAAAAAJgD/wABBAAAAAAAAASNRdWFudGlsZS1RdWFudGlsZSBQbG90IG9mIeRhdGFzZXQgMQEbUmza1diaWJ1bGwoMC43NDExMCwyNjE2LjUpAQEFAAEAQMAAQD/AQEBAQEOSW5wdXQgUXVhbnRp bGUBAQEEAgABAQEBAGaXR0ZWQgUXVhbnRpGUBAQEEAgAJzwAH3QAH8AAHAWEHFgEHKQEHPAEHTwEHYgEHdgAHV2pYnVsbaALwETAAxVbnVzZWQgQ3VydmlUAUu8BEwAMVW51c2VkiEN1cnZIAKMARMADFVu gQ3VydmlUABDkBEwAMVW51c2VkiEN1cnZIAVOARMADFVu dXNIZCBDdXJ2ZQADTAETAxVbnVzZWQ
11	

	1
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	Result Display Options
11	23

	A	B	C	D	E	F	G	H	I
1	@RISK Fit Results								
2	Performed By: mgf								
3	Date: Thursday, January 10, 2013 3:58:35 PM								
4									
5		Input	Weibull	LogLogistic	Lognorm	Expon	InvGauss	Triang	
6	Fit								
7	Function	RiskWeibull(0.77111,2486)	RiskLoglogistic(0,1319.5,1.0567)	RiskLognorm(4182.5,14418.5)	RiskExpon(2875.1)	RiskInvgauss(2875.1,388.8)	RiskTriang(0.85,10859)		
8	Distribution Statistics								
9	Minimum	85	0	0	0	0	0	0	0
10	Maximum	9000	+Infinity	+Infinity	+Infinity	+Infinity	+Infinity	10859.733	
11	Mean	2875.0794	2894.9742	23364.5823	4182.457	2875.0794	2875.0794	3648.2443	
12	Mode	307.8750 [est]	0	44.1408	90.4348	0	129.3362	85	
13	Median	2170	1545.5567	1319.4588	1165.1973	1992.8532	651.2608	3210.8532	
14	Std. Deviation	3401.459	3798.2672	+Infinity	14418.4981	2875.0794	7818.3327	2549.7053	
15	Skewness	1.338	2.9844	+Infinity	51.3121	2	8.158	0.5656	
16	Kurtosis	3.3201	17.4885	+Infinity	32331.3736	9	113.9226	2.4	
17	Percentiles								
18	5%	85	53	81	84	147.4723	95.6162	316.4798	
19	10%	85	134	165	150	302.9198	133.1955	597.6839	
20	15%	100	235.6057	255.5747	222.2144	467.2548	170.8105	886.8139	
21	20%	100	355.4131	355.3556	303.4145	641.5554	211.5924	1184.5803	
22	25%	487.4615	494.0949	466.5449	396.3517	827.1088	257.5085	1491.8067	
23	30%	487.4615	652.9529	591.8033	503.8396	1025.4688	310.4889	1809.4564	
24	35%	1110	834.0716	734.4903	629.3029	1238.5351	372.8194	2138.6682	
25	40%	1110	1040.3679	899.0001	777.1286	1468.6642	447.4514	2480.805	
26	45%	2170	1275.7728	1091.2522	953.1231	1718.8288	538.3879	2837.5202	
27	50%	2170	1545.5567	1319.4588	1165.1973	1992.8532	651.2608	3210.8532	
28	55%	2170	1856.8623	1595.3887	1424.459	2295.773	794.2715	3603.3685	
29	60%	2200	2219.5786	1936.5644	1747.0529	2634.4086	979.8093	4018.3669	
30	65%	2200	2647.8307	2370.3124	2157.4422	3018.322	1227.4074	4460.221	
31	70%	2410	3162.661	2941.8074	2694.6768	3461.5174	1569.5058	4934.9362	
32	75%	2410	3797.2461	3731.6271	3425.4545	3985.7064	2063.6655	5451.1582	
33	80%	8313.253	4608.1592	4899.2369	4474.687	4627.2618	2821.4547	6022.1567	
34	85%	8313.253	5703.5807	6811.9877	6109.7953	5454.3706	4088.1192	6670.269	
35	90%	9000	7332.2594	10553.6006	9041.0664	6620.115	6521.2939	7439.0499	
36	95%	9000	10314.5119	21403.6208	16161.115	8612.9681	12711.2746	8440.9446	
37	Chi-Squared Test								
38	Chi-Sq Statistic		0.1111	0.1111	0.1111	0.1111	1	2.7778	
39	P-Value		0.7389	0.7389	0.7389	0.7389	0.3173	0.0956	
40	Cr. Value @ 0.750		0.1015	0.1015	0.1015	0.1015	0.1015	0.1015	
41	Cr. Value @ 0.500		0.4549	0.4549	0.4549	0.4549	0.4549	0.4549	
42	Cr. Value @ 0.250		1.3233	1.3233	1.3233	1.3233	1.3233	1.3233	
43	Cr. Value @ 0.150		2.0723	2.0723	2.0723	2.0723	2.0723	2.0723	
44	Cr. Value @ 0.100		2.7055	2.7055	2.7055	2.7055	2.7055	2.7055	
45	Cr. Value @ 0.050		3.8415	3.8415	3.8415	3.8415	3.8415	3.8415	
46	Cr. Value @ 0.025		5.0239	5.0239	5.0239	5.0239	5.0239	5.0239	
47	Cr. Value @ 0.010		6.6349	6.6349	6.6349	6.6349	6.6349	6.6349	
48	Cr. Value @ 0.005		7.8794	7.8794	7.8794	7.8794	7.8794	7.8794	
49	Cr. Value @ 0.001		10.8276	10.8276	10.8276	10.8276	10.8276	10.8276	
50	Chi-Sq Test (Binning Information)								
51	Bin #1 : Minimum		0	0	0	0	0	0	
52	Bin #1 : Maximum		1545.5567	1319.4588	1165.1973	1992.8532	651.2608	3210.8532	
53	Bin #1 : Input		4	4	4	4	3	7	
54	Bin #1 : Fit		4.5	4.5	4.5	4.5	4.5	4.5	
55	Bin #2 : Minimum		1545.5567	1319.4588	1165.1973	1992.8532	651.2608	3210.8532	
56	Bin #2 : Maximum		+Infinity	+Infinity	+Infinity	+Infinity	+Infinity	10859.733	
57	Bin #2 : Input		5	5	5	5	6	2	
58	Bin #2 : Fit		4.5	4.5	4.5	4.5	4.5	4.5	
59	Anderson-Darling Test								
60	A-D Statistic		0.3376	0.3865	0.426	0.7919	1.0979	2.3784	
61	P-Value		> 0.25	N/A	N/A	0.15 <= p <= 0.25	N/A	N/A	
62	Cr. Value @ 0.750		N/A	N/A	N/A	N/A	N/A	N/A	
63	Cr. Value @ 0.500		N/A	N/A	N/A	N/A	N/A	N/A	
64	Cr. Value @ 0.250		0.4444	N/A	N/A	0.69	N/A	N/A	
65	Cr. Value @ 0.150		N/A	N/A	N/A	0.8588	N/A	N/A	
66	Cr. Value @ 0.100		0.5972	N/A	N/A	0.9956	N/A	N/A	
67	Cr. Value @ 0.050		0.7097	N/A	N/A	1.2384	N/A	N/A	
68	Cr. Value @ 0.025		0.8222	N/A	N/A	1.4916	N/A	N/A	
69	Cr. Value @ 0.010		0.9731	N/A	N/A	1.8366	N/A	N/A	
70	Cr. Value @ 0.005		N/A	N/A	N/A	2.1038	N/A	N/A	

	J	K
1		
2		
3		
4		
5	Uniform	BetaGeneral
6		
7	RiskUniform(0,10125)	RiskBetaGeneral([0.34104,0.43929,0,9000])
8		
9	0	0
10	10125	9000
11	5062.5	3933.4259
12	0	0
13	5062.5	3325.9455
14	2922.8357	3345.7351
15	0	0.2436
16	1.8	1.4783
17		
18	506.25	4.6628
19	1012.5	35.5383
20	1518.75	116.2484
21	2025	266.2939
22	2531.25	510.1788
23	3037.5	856.0349
24	3543.75	1314.062
25	4050	1885.049
26	4556.25	2561.2575
27	5062.5	3325.9455
28	5568.75	4153.7574
29	6075	5012.1072
30	6581.25	5863.5332
31	7087.5	6668.8416
32	7593.75	7390.7062
33	8100	7997.3097
34	8606.25	8465.6226
35	9112.5	8784.0916
36	9618.75	8955.0397
37		
38	2.7778	2.7778
39	0.0956	0.0956
40	0.1015	0.1015
41	0.4549	0.4549
42	1.3233	1.3233
43	2.0723	2.0723
44	2.7055	2.7055
45	3.8415	3.8415
46	5.0239	5.0239
47	6.6349	6.6349
48	7.8794	7.8794
49	10.8276	10.8276
50		
51	0	0
52	5062.5	3325.9455
53	7	7
54	4.5	4.5
55	5062.5	3325.9455
56	10125	9000
57	2	2
58	4.5	4.5
59		
60	4.1516	+Infinity
61	N/A	N/A
62	N/A	N/A
63	N/A	N/A
64	N/A	N/A
65	N/A	N/A
66	N/A	N/A
67	N/A	N/A
68	N/A	N/A
69	N/A	N/A
70	N/A	N/A

	A	B	C	D	E	F	G	H	I
71		Cr. Value @ 0.001		N/A	N/A	N/A	2.3756	N/A	N/A
72	Kolmogorov-Smirnov Test								
73		K-S Statistic		0.1545	0.184	0.2069	0.2102	0.3141	0.388
74		P-Value		> 0.1	N/A	N/A	> 0.15	N/A	N/A
75		Cr. Value @ 0.750		N/A	N/A	N/A	N/A	N/A	N/A
76		Cr. Value @ 0.500		N/A	N/A	N/A	N/A	N/A	N/A
77		Cr. Value @ 0.250		N/A	N/A	N/A	N/A	N/A	N/A
78		Cr. Value @ 0.150		N/A	N/A	N/A	0.2925	N/A	N/A
79		Cr. Value @ 0.100		0.2519	N/A	N/A	0.3126	N/A	N/A
80		Cr. Value @ 0.050		0.2712	N/A	N/A	0.3415	N/A	N/A
81		Cr. Value @ 0.025		0.2913	N/A	N/A	0.3677	N/A	N/A
82		Cr. Value @ 0.010		0.3125	N/A	N/A	0.401	N/A	N/A
83		Cr. Value @ 0.005		N/A	N/A	N/A	N/A	N/A	N/A
84		Cr. Value @ 0.001		N/A	N/A	N/A	N/A	N/A	N/A

	J	K
71	N/A	N/A
72		
73	0.5398	0.3384
74	N/A	N/A
75	N/A	N/A
76	N/A	N/A
77	N/A	N/A
78	N/A	N/A
79	N/A	N/A
80	N/A	N/A
81	N/A	N/A
82	N/A	N/A
83	N/A	N/A
84	N/A	N/A